Lightning Hybrids

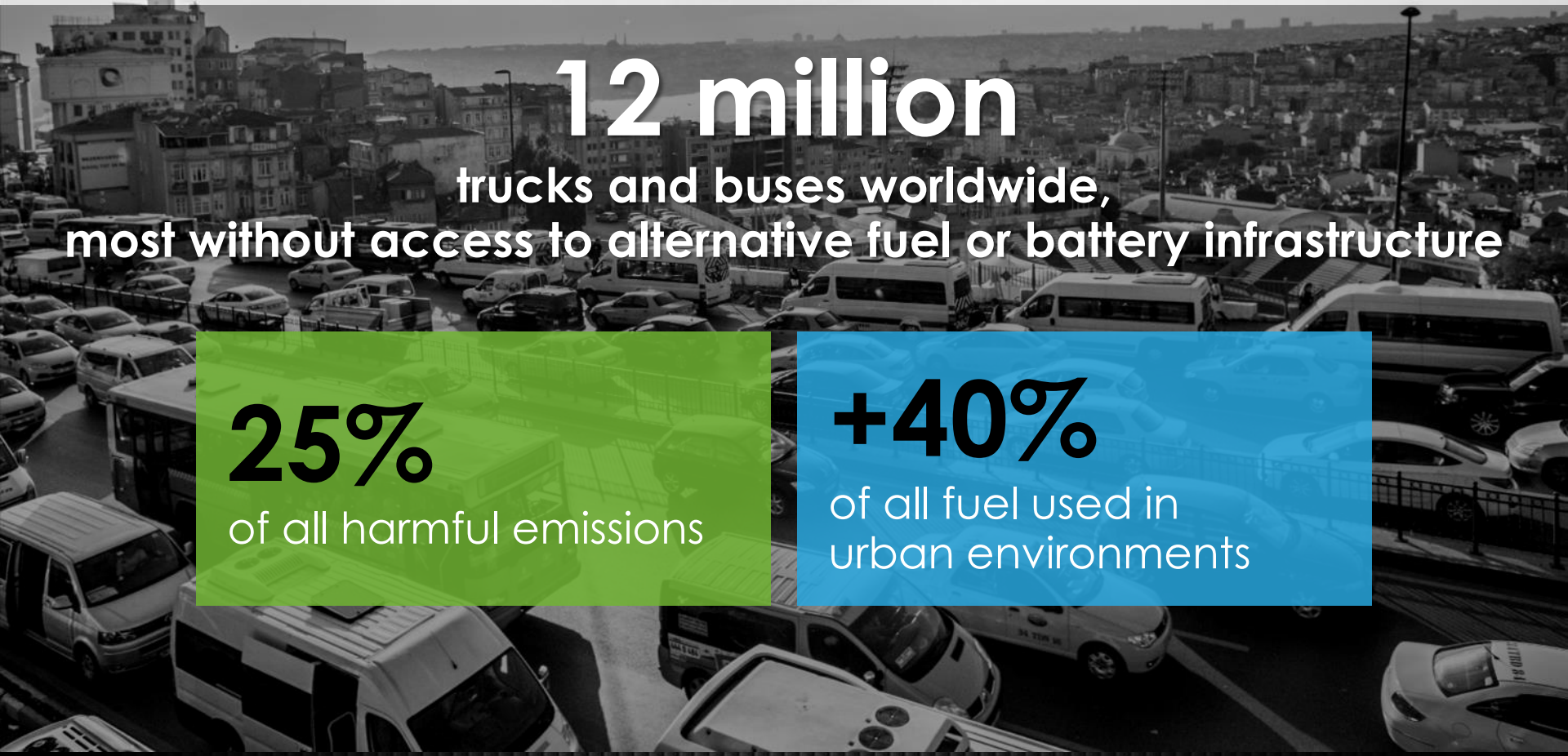
NREL Industry Growth Forum

TIM REESER / President

NOVEMBER 2015

START/STOP URBAN TRUCKS AND BUSES . . .

A Global Problem



12 million

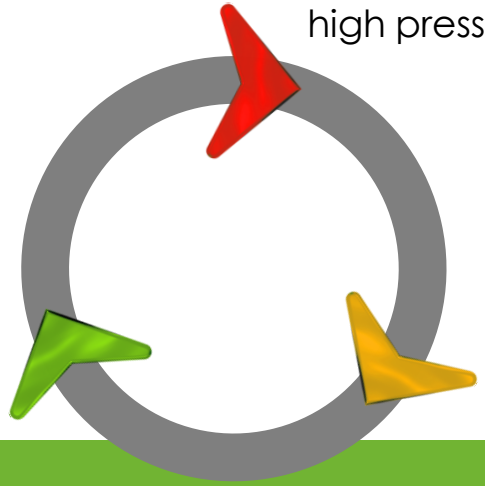
trucks and buses worldwide,
most without access to alternative fuel or battery infrastructure

25%
of all harmful emissions

+40%
of all fuel used in urban environments

Lightning Hybrids:
The Solution

BRAKING energy pumps hydraulic fluid from the low pressure to the high pressure tank



ACCELERATION by hydraulic pressure driving the hydraulic motors

Energy is **STORED** in the form of hydraulic pressure in the high pressure tank

Capturing Braking Energy
to Power Vehicle Acceleration

Lightning Hybrids

International Success to Date

	US	EUROPE	CANADA	ASIA
Vehicles on the Road	75	5 (Pilot)	2 (Pilot)	2 (Pilot)
Chassis Available	10	7	10	4

Lightning Hybrids

Well-Established Company

Founded in 2008

to Design and Manufacture Hybrid Systems for Trucks and Buses

$15M
invested to date

Castrol innoVentures

Shell Foundation

CoorsTek Amazing Solutions®

Aravaipa Ventures

43
hi-tech team members

$1.4M
in LTM sales, strong pipeline

UPS

DHL

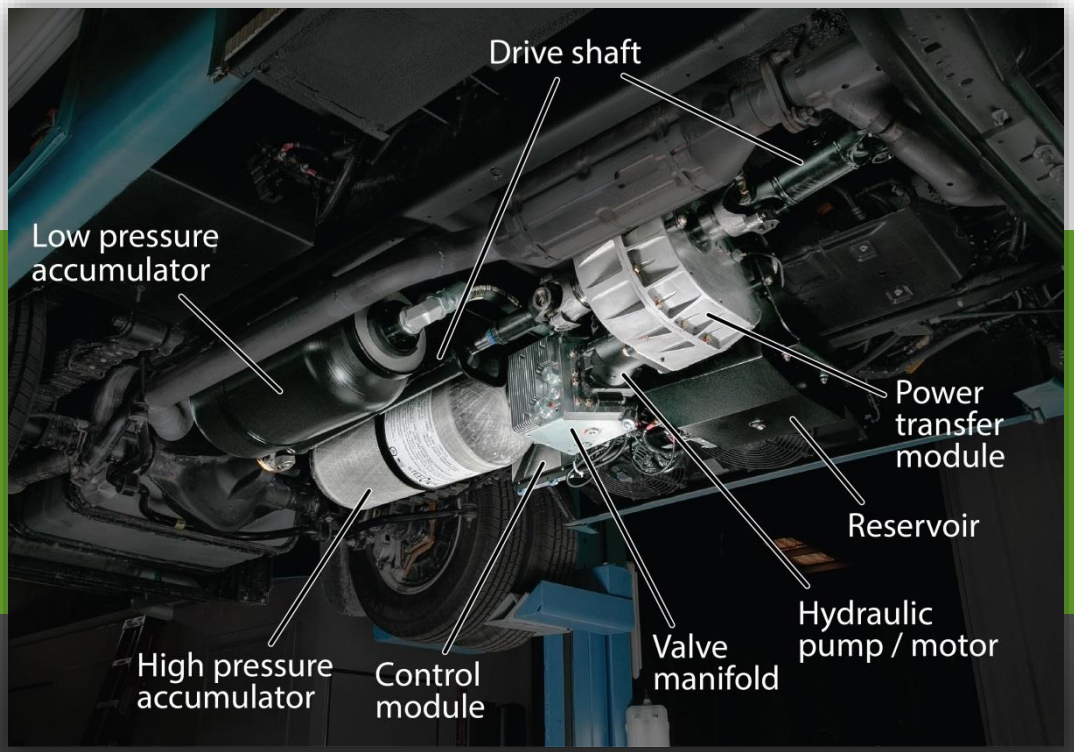
United States Postal Service

City of Istanbul

Targeting a **$150B+** Opportunity

Lightning Hybrids Energy Recovery System

Elegant Design



Modular Flexibility

EASILY EXTENDED
Adaptable to new platforms and purposes

BROADLY APPLICABLE
From trucks and buses to shipping cranes

SIMPLE INSTALLATION
Fleets and dealers can install it in one day

Lightning Hybrids

Significant, Measureable Benefits

Lightning Hybrids

REDUCES EMISSIONS
Verified 30-95% emissions decrease

SAVES FUEL
20-35% fuel economy increase in urban drive cycles

NO INFRASTRUCTURE REQUIRED
Can be used on existing roads with existing vehicles

ACCELERATES ROI
Faster time to benefit

IMPROVES SAFETY
More power for acceleration and fade-free braking

Compelling Value for Multiple Stakeholders

OEMs

Meet new emissions standards

Meet new fuel economy standards

Fleet Owners

25 – 35% increase in fuel economy

Communities

Better acceleration and braking means a safer drive

Environment

30 – 95% decrease in emissions

International Customer Base

Engaged and Committed Early Adopters

Reducing Emissions for UPS, Creating New Choices and Flexibility

UPS pilot used gasoline engine identical to Lightning Hybrids' test vehicle

Fuel Economy	CO_2 Emissions	NO_X Emissions	NO_X Emissions
15 – 35% ↑	↓ 15 – 35%	↓ 50%	↓ 95%

Economically feasible to purchase a more efficient, cleaner gasoline engine instead of diesel

Lightning Hybrids

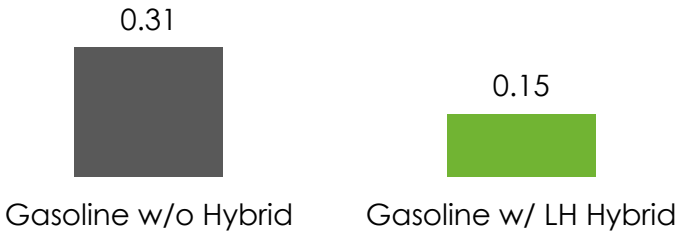
Demonstrated Emissions Reductions

THIRD PARTY EMISSIONS RESULTS

50% Reduction in NOx

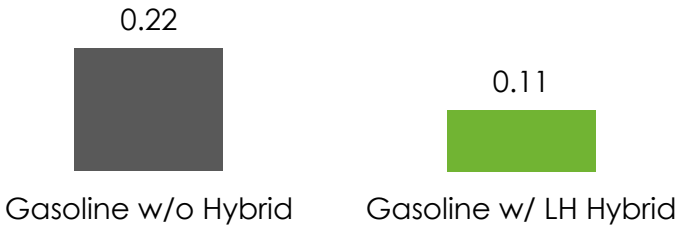
ORANGE COUNTY BUS CYCLE

NOx g/Mile



BRAUNSCHEWEIG CITY BUS CYCLE

NOx g/Mile



15% Reduction in CO_2

ORANGE COUNTY BUS CYCLE

CO_2 g/Mile

BRAUNSCHEWEIG CITY BUS CYCLE

CO_2 g/Mile

Source: White Paper "Emissions Test Results: Lightning Hybrids Hydraulic Hybrid System Installed on a GM 6.0L Gasoline Truck" April, 2015

Not Your Father's Low-Margin Automotive Supplier Company: Multiple High-Margin Drivers

International Product Mix

Few Competitors

25 - 40%
Margin

Strong IP and Innovation

High Barriers to Entry

Lightning Hybrids

Strong IP and Innovation Creates Significant Barriers to Entry

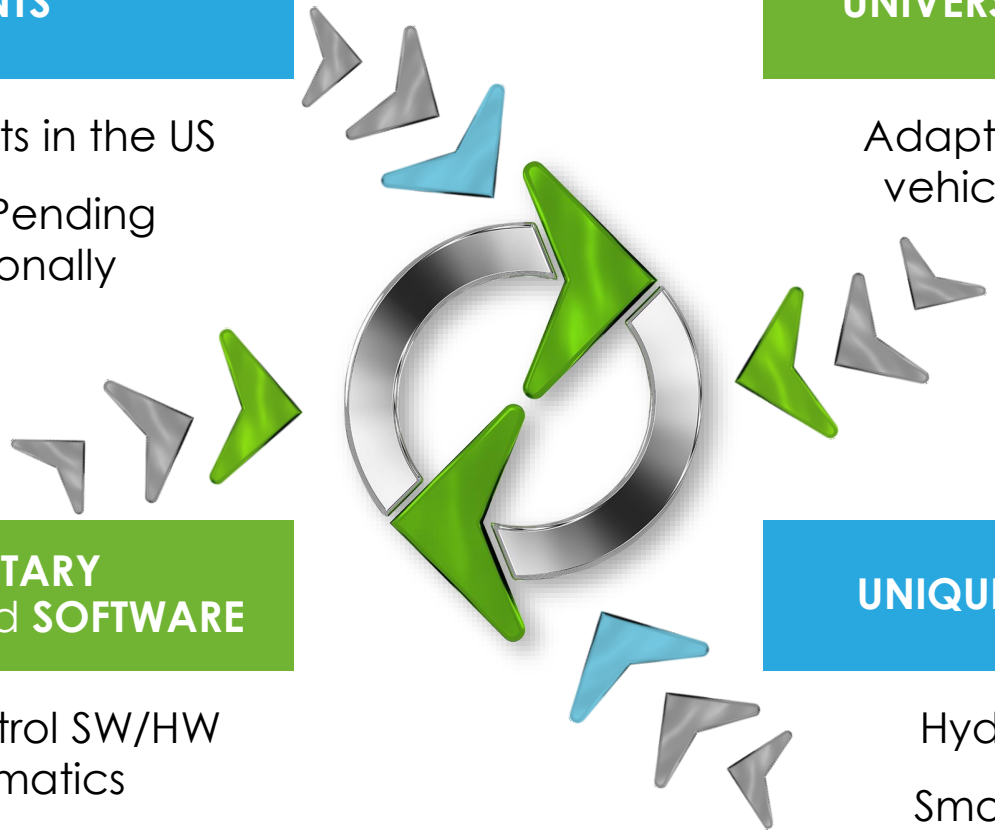
PATENTS

2 Utility Patents in the US

2 Patents Pending Internationally

UNIVERSAL PACKAGING

Adaptable to multiple vehicles and chassis



PROPRIETARY HARDWARE and SOFTWARE

Universal control SW/HW with telematics

Remote maintenance and support

UNIQUE ARCHITECTURE

Hydraulic design

Smooth, elegant, reliable, and safe

Platform Can be Extended to Many Chassis

SYSTEMS FOR 7 INTERNATIONAL MANUFACTURERS

Ford · GM · FREIGHTLINER · Mercedes-Benz · VOLVO · DAF · ASHOK LEYLAND

+25 CHASSIS PLATFORMS AVAILABLE TODAY

Vehicles with Frequent Start/Stop Cycles in Urban Environments

BUSES

- Municipal
- Senior
- Parking Shuttle
- Tourist
- School
- Corporate Shuttle

TRUCKS

- Delivery
- Beverage
- Refuse
- Logistics
- Mail
- Linen

10+ Chassis Platforms to Be Added in the Next Year

Significant Market Opportunity

$150B WORLDWIDE ADDRESSABLE MARKET

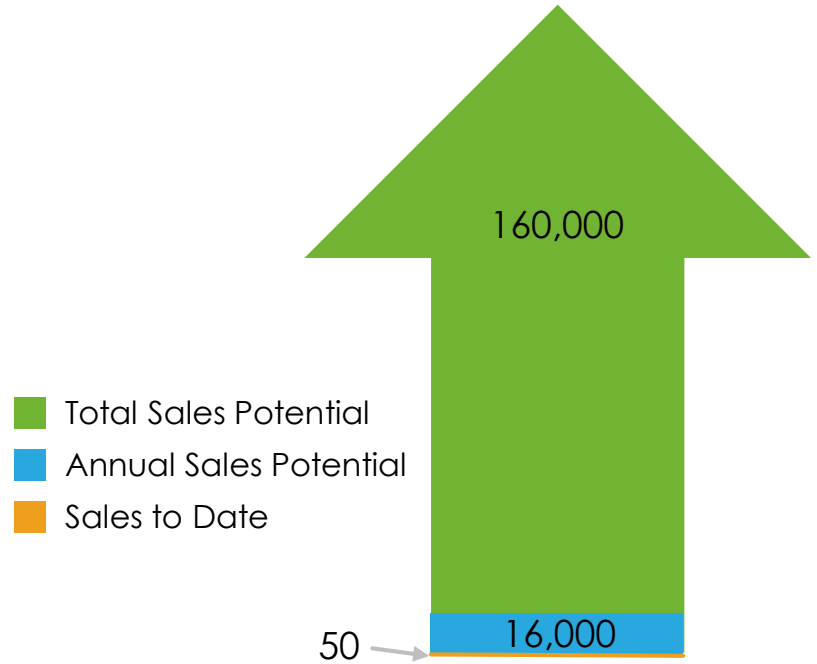
Opportunities in Retrofit AND New Vehicles

12M
vehicles on the road today

500,000
NEW
vehicles annually

HEADROOM FOR GROWTH WITHIN CURRENT CUSTOMER BASE

Top 10 Customers



Lightning Hybrids

We Understand Our Customers' Challenges Well

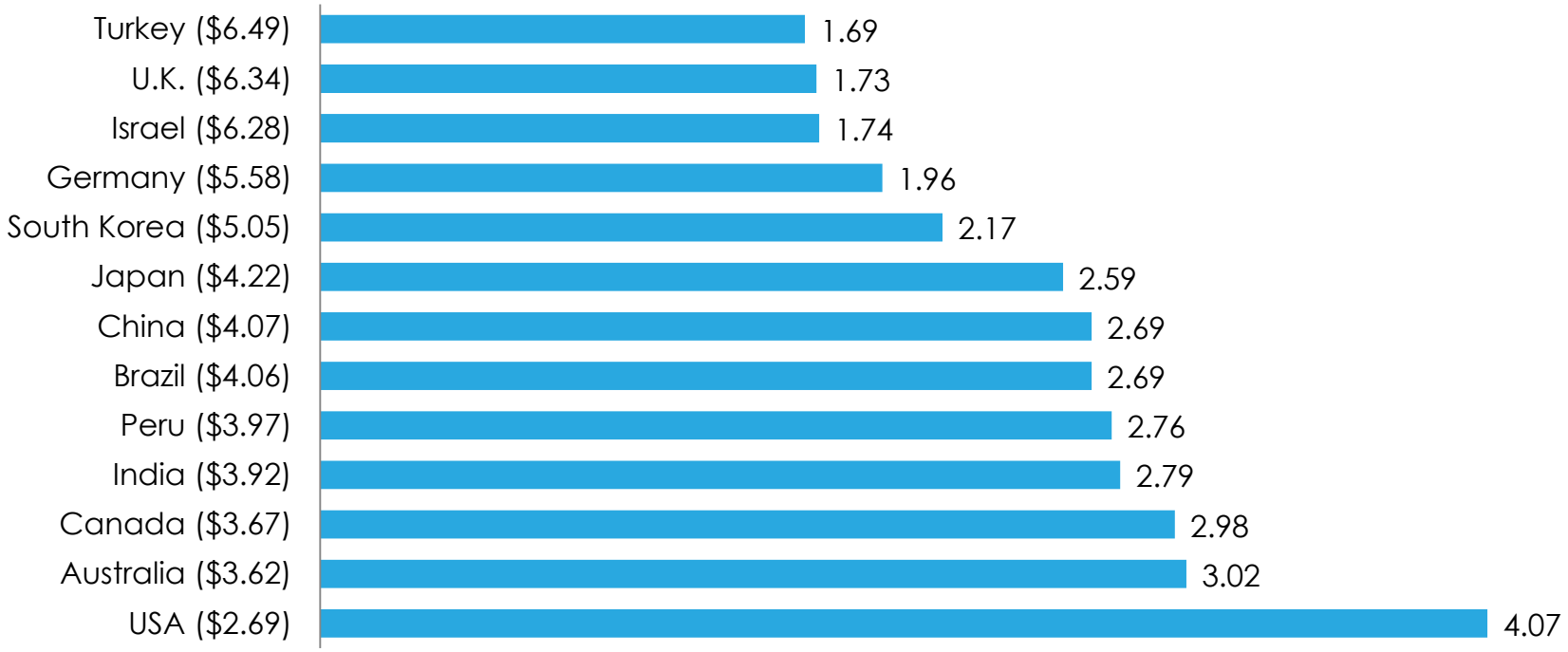
MULTIPLE TRENDS DRIVE GROWING INTEREST

1. **Euro VI and Phase 2** emissions standards are forcing spotlight on emissions
2. High **miles**
3. Lots of **stop and go**
4. Focus on the **numbers**

Higher International Fuel Prices Accelerate Customer Value

FUEL-ONLY SAVINGS ROI

YEARS



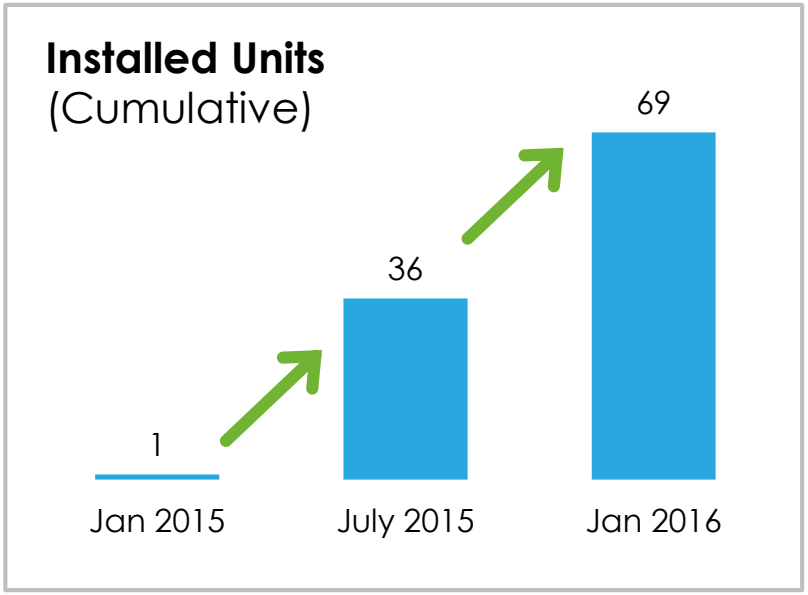
Miles driven annually: 48,000 Pre-hybrid MPG (US): 6 **Does not include brake savings.**
Prices are USD per US gallon, as of September 15th 2015

Source: http://www.mytravelcost.com/petrol-prices/

Strong Follow-On Growth Within Existing Customers

KIESSLING TRANSIT

700 BUSES IN THE BOSTON AREA



Lightning Hybrids

We Are A Leader in Emissions Innovation

TECHNOLOGY DEVELOPMENT

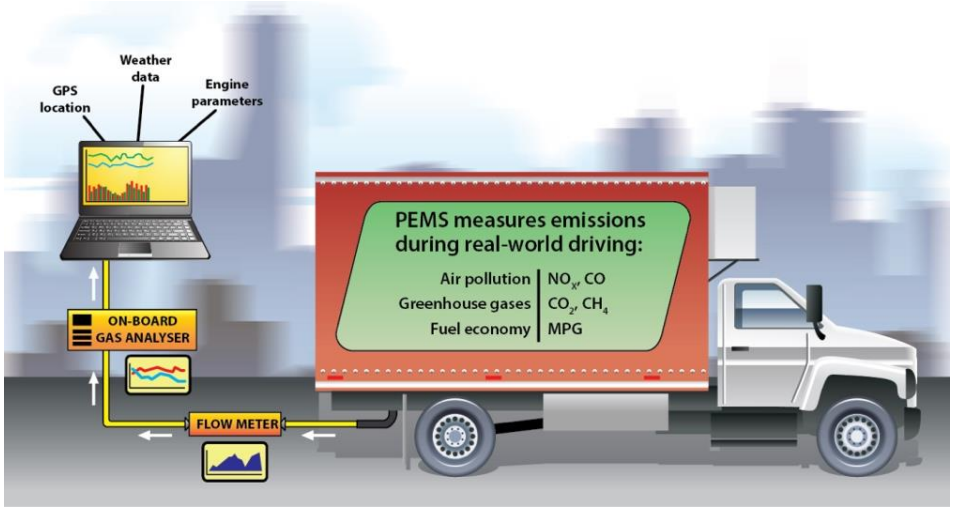
- Hydraulics are able to provide higher emissions reduction due to reaching **higher torque**

RESEARCH AND TESTING

- Partnership with **Colorado State University Engines and Energy Lab**
- Worked with **SGS Emissions Testing Lab** for EPA test results

PEMS

- Portable Emissions Monitoring System (PEMS) to prove real-world emissions data



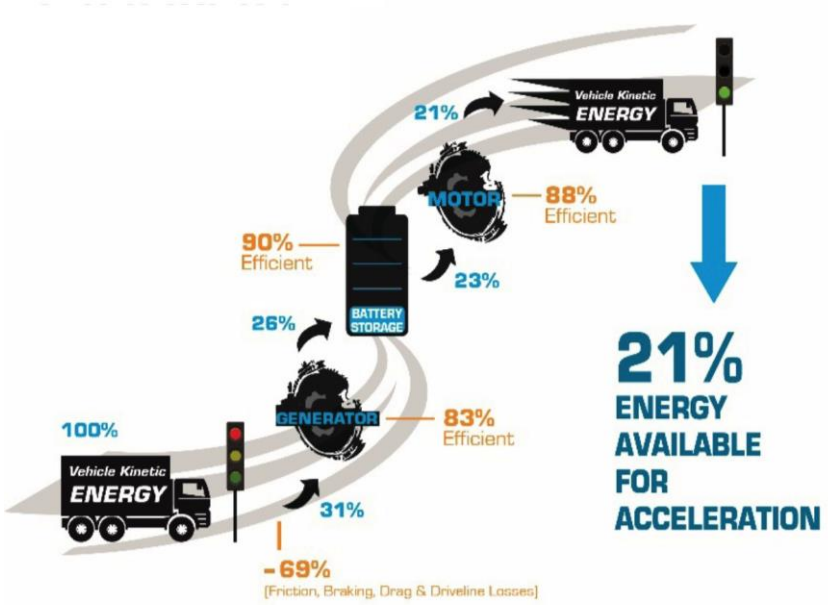
Lightning Hybrids

Electrics Cannot Compete in the Heavy Duty Space

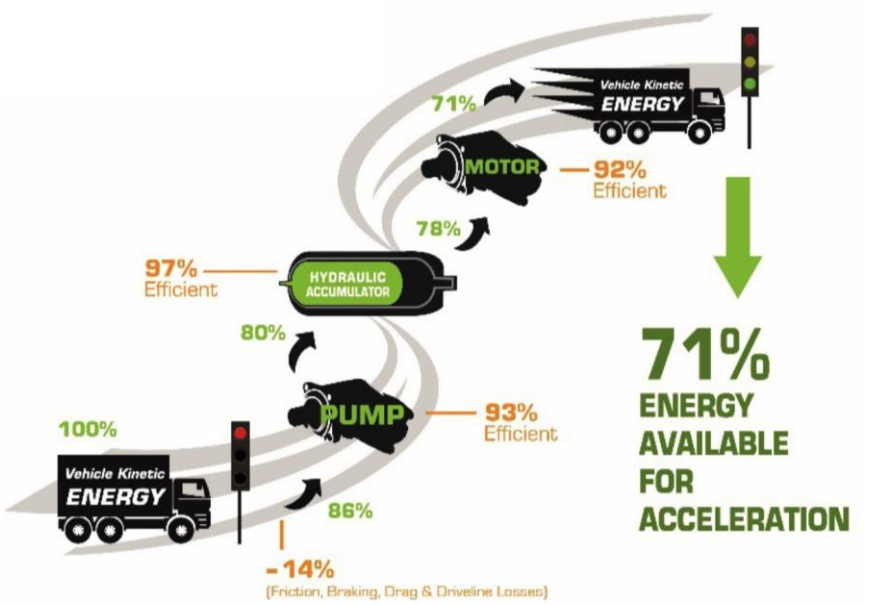
	HYDRAULIC HYBRID	ELECTRIC HYBRID	FULL ELECTRIC	CNG
Incremental Cost	$20k - $35k	$300k	$1M per Bus	$40k
Infrastructure Required	None	Moderate	Extensive Expensive	Limited
Battery Life	Life of Vehicle	Limited	Limited	Life of Vehicle
Efficiency	>70% Recovery	<30% Recovery	>80%	< Gasoline

Hydraulic Hybrids Offer Higher Round Trip Efficiency

ELECTRIC
Regeneration



HYDRAULIC
Regeneration



Analysis by University of Michigan Automotive Research Center
Data typical for class 6 delivery truck

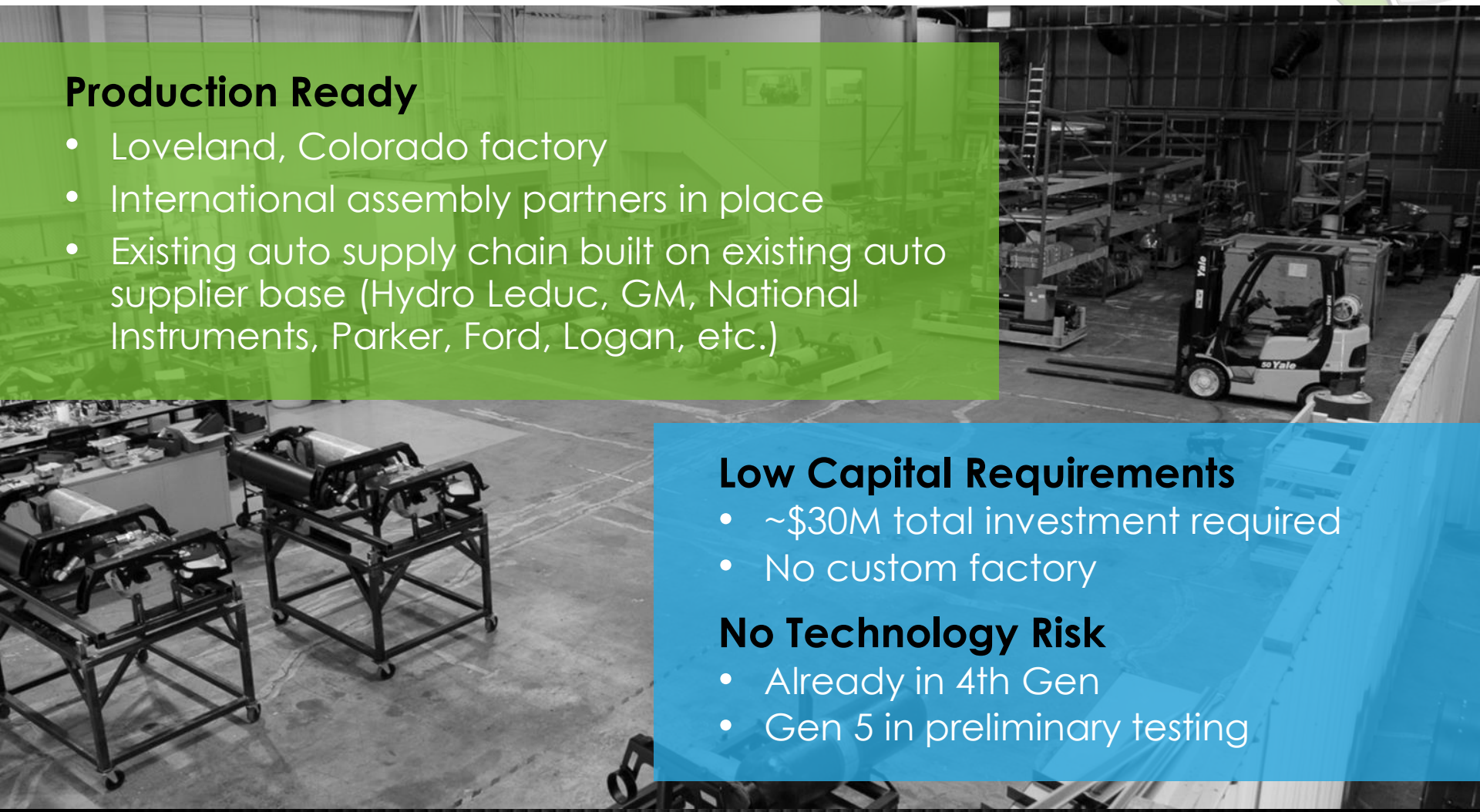
Lightning Hybrids

Multiple Distribution Channels in Place

	IN PLACE	IN DISCUSSION
OEMs, Upfitters and Dealers	8 SIGNED MORGAN OLSON UPS/FedEx Truck Bodies, Refridgerated Trucks, etc. Volare Brazilian Microbuses STANDART BUS Turkish Refuse Trucks	Ford, GM, VOLVO Mercedes-Benz, ASHOK LEYLAND TATA MOTORS, DAF, Marcopolo
Direct to Fleet	EARLY ADOPTERS AND VERY LARGE FLEETS UPS, DHL, national express AmeriPride Services Inc, MV	CINTAS, Peapod, FedEx 

Lightning Hybrids

Company Ready to Scale, Cost Efficiently



Production Ready

- Loveland, Colorado factory
- International assembly partners in place
- Existing auto supply chain built on existing auto supplier base (Hydro Leduc, GM, National Instruments, Parker, Ford, Logan, etc.)

Low Capital Requirements

- ~$30M total investment required
- No custom factory

No Technology Risk

- Already in 4th Gen
- Gen 5 in preliminary testing

Experienced Team

Tim Reeser	President	Founded and led multiple IT and Cleantech companies with successful funding and exits
Robert Fenwick-Smith	Board Chair, CFO	Founder of Aravaipa Ventures
Dave Brosky	VP Sales	25 years automotive and manufacturing experience, previously with Bosch-Rexroth
Brian Johnston	Customer Operations	25 years Navy, aerospace and and high tech automotive
Rob Mulcair	Controller	30 years experience in large companies and startups
Ed Reineke	Manufacturing Director	30 years experience in manufacturing and executive leadership
Tim Sherwood	Managing Director International Business	25 years International business development experience
Mark Stauder	Engineering Director	20 years experience in engineering design
Bonnie Trowbridge	VP Communications	25 years experience in PR, marketing, and grant writing

Strong Engineering and Manufacturing Team

Testing, efficiency prediction and modeling, production, customer support, software controls, hardware controls

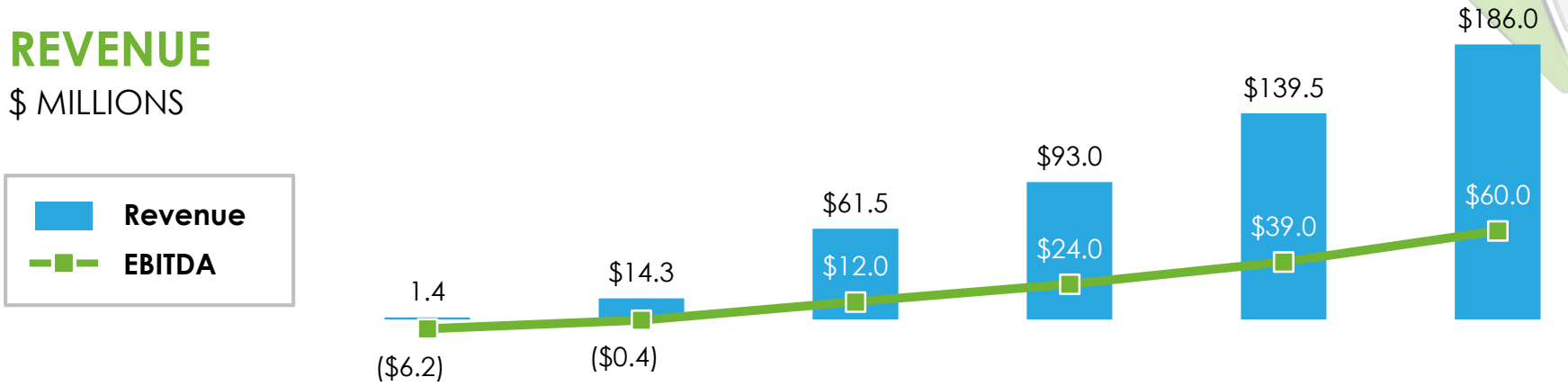
- Product Engineering
- Manufacturing and Scaling
- Transportation Industry
- International Expansion

Lightning Hybrids

Financial Projections

REVENUE

$ MILLIONS



	2015	2016	2017	2018	2019	2020
# Hybrid Systems	81	1,400	3,970	6,000	9,000	12,000
Revenues	$1.4M	$14.3M	$61.5M	$93.0M	$139.5	$186M
Gross Margin	0%	30%	34%	35%	36%	40%
EBITDA	($6.2M)	($2.4M)	$12.0M	$24.0M	39.0M	60.0M

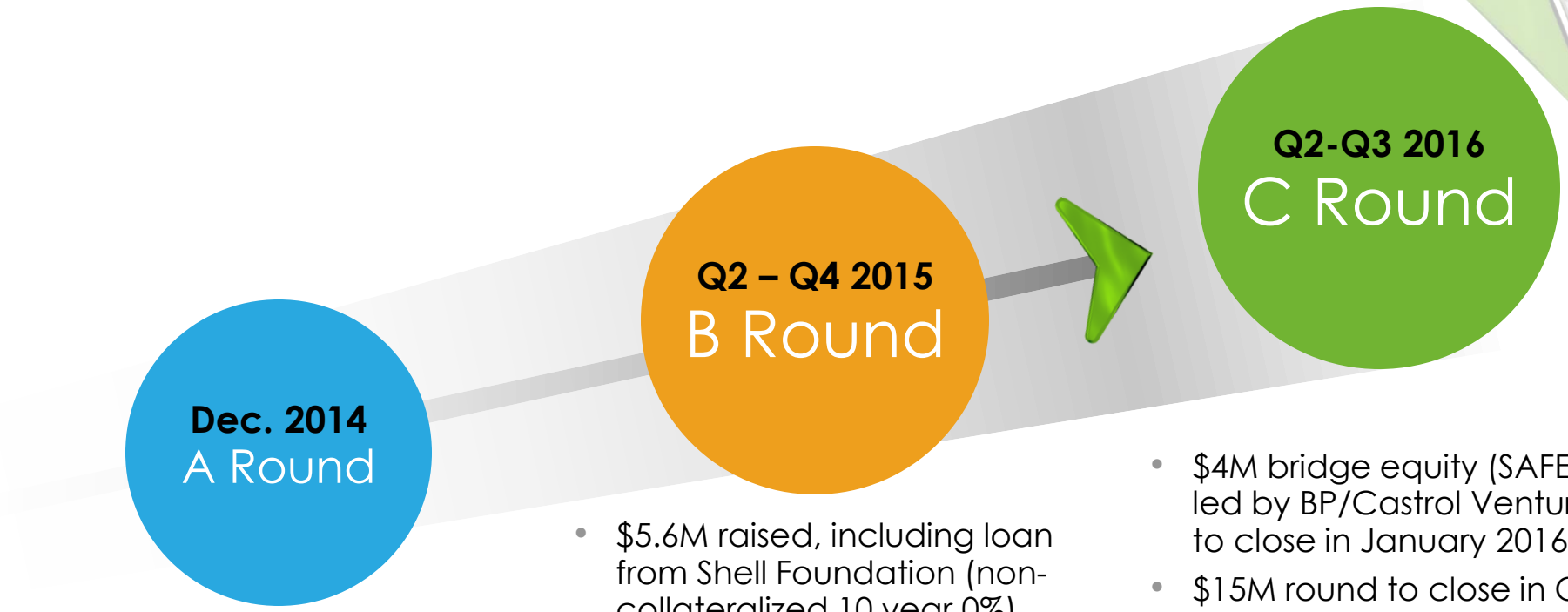
Current pipeline exceeds 13,000 systems – DHL and UPS alone could exceed entire 2020 sales projections

Larger fleets will be $10-50M customers

Projections do not include licensing opportunities to large international groups that are currently showing interest

Lightning Hybrids

$15M Funding to Date, Currently Raising B Round



- $3.0M raised, including $500k grant from State of Colorado
- Completed R&D for production system, place paid pilot systems with large customers

- $5.6M raised, including loan from Shell Foundation (non-collateralized 10 year 0%)
- Used to accelerate presence in the UK, Mexico, and India
- Built and sold first 50 systems and achieved 40% cost reductions from engineering and volume purchase

- $4M bridge equity (SAFE) led by BP/Castrol Ventures to close in January 2016
- $15M round to close in Q3 (strategics, impact investors)
- Used to scale up international manufacturing and channel sales team
- Scale QA/QC systems and processes (ISO, CE, QVM)

PROVEN
Platform and customer value

STRONG
Customer traction

LARGE
Worldwide market

Lightning Hybrids

SIGNIFICANT
Barriers to entry

HIGH MARGIN
Scalable business

EXPERIENCED
Team in place

Lightning Hybrids

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